INTRODUCTION

GENERAL

NRCS policy is that economic effects of alternative actions should be provided to NRCS customers in order for them to make informed resource decisions. Cost information should be used as a part of analyzing and evaluating the economic effects of conservation systems. The purpose of the Cost Data Section is to provide NRCS personnel guidance the development and use of cost data and cost lists, and provide state average cost data.

The initial phase of evaluation the effectiveness of conservation measures is the collection, analysis, and use of current information on costs and prices. Economic data is used by our customers in making informed natural resource decisions. Cost information is used in the analysis of alternative plans as well as evaluation of alternatives. Cost data is used to develop cost lists and estimates of costs for conservation practices. Cost Data is updated annually.

BASIC PRINCIPLES

An understanding of a few basic economic principles and concepts is useful in appreciating how and why farmers react to changes in economic conditions. Many economic principles are only a formal organization of basic common sense that can help the conservation planner provide economically feasible and cost effective alternatives to clients. Clients make decisions on the allocation of land, capital and labor inputs. Each one of these inputs has a cost associated with it. The implementation of a conservation practice alters the input mix and the costs of production. The conservation planner needs to be prepared to discuss the resource changes and costs necessary to successfully install, operate and maintain the conservation alternative that is being recommended.

The benefits of conservation occur both on site and off site. Farmers do not generally account for pollution's (runoff sediment, nutrients, chemicals or pathogens) cost to others (off site) when making their production decisions. The costs of production with conservation is often compared to only the on site benefits. The government provides incentives or cost share to producers to influence them to alter production processes to reduce pollution effects off site.

The human considerations should be included early in the planning process. Follow the guidelines in the National Planning Procedures Handbook (NPPH) 600.11 (h) Social and Economic Considerations. The NPPH provides information on the inventory methods and data sources for economic and social considerations in the planning process. NPPH 600.46 Working with Individuals and Groups provides guidance on understanding and working with clients and stakeholders.

WITH AND WITHOUT CONDITIONS

The generally acceptable basis for computing effects of conservation measures is the with and without approach. Effects are measured as the differences expected with the measures installed with those expected from using the resource without measures. Generally, in evaluations of resource management systems, net returns can be used as the appropriate comparison of how profits are changed with conservation installed.

Planning horizons should be based on the useful life of the conservation practices. Time frame may also depend on how quickly an individual wants to recover their investment. In some cases you need to use the financial life (loan repayment period) which can be much shorter than the economic life (physical useful life) of the improvement.

The National Economics Handbook provides procedures and instructions on application of economic methods/tools to compare conservation systems. These evaluations are not intended to be used as an analysis of the farm business. A farmer desiring farm management assistance should be referred to Cooperative Extension or other farm management assistance providers.

DEFINITIONS OF ECONOMIC TERMS

AMORTIZATION

The process of calculation to take a lump sum and put it into periodic payments (principal and interest).

AVERAGE ANNUAL BENEFITS

Average annual benefits are the amortized stream of benefits expected over the life of the conservation practice or system.

AVERAGE ANNUAL COSTS

Average annual costs are the sum of the amortization of the installation cost over their expected life and the annual operation and maintenance costs.

BENEFIT COST RATIO

The benefit to cost ratio (benefits divided by costs) is one of several ways to determine the economic worth of a conservation measure. A ratio of 1 or greater means benefits exceed costs. The benefits and costs must be from a common time basis, usually converted to average annual values through the use of amortization or discounting.

BREAKEVEN POINT

Breakeven point is where the benefits equal the costs.

DEPRECIATION

Depreciation is an asset's loss in value due to wear, age and obsolescence. Depreciation is an accounting and financial concept used in the allocation of an asset's cost over it's productive life. Several methods can be used to determine depreciation. Depreciation is taken into account when determining the useful life of conservation practices.

DISCOUNTING

Discounting is a technique for translating values from one time period to another in order to express the values in consistent terms. Costs and benefits frequently paid and received at different points over the course of sometimes long time horizons. In the evaluation process discounting is used to describe future effects in terms of present day values. Discounting is accomplished by multiplying future values by discounting factors that reflect both amount of time between present and future and the degree of value (interest rate).

ECONOMIC LIFE

The effective economic life is determined using expected deterioration, obsolescence, depreciation, changing needs and improvements in technology.

ECONOMIES OF SIZE

Economies of size is a long term concept about the average total cost per unit of production as the farm increases in size. As the farm increases in size the long term average cost decrease. Reasons are as the farm increases in size they can achieve more complete utilization of labor and machinery, the ability to increase capacity, and to purchase inputs at a lower price because they buy a larger volume. Economies of size and

economies of scale are sometimes used interchangeably in every day usage but they have slightly different meanings when used by an economist. Economies of size simply means more output by the increase of one or more inputs. An example of economies of size would be adding more land while farming it with increased time and not adding or increasing machinery. Economies of scale refers to increase in output when all inputs are increased by the same proportion.

FINANCIAL LIFE

The time frame equal to the time to repay a loan or time frame that financing of production is expected to take place.

INSTALLATION COSTS

Installation costs are expenditures for initial construction of resource improvement. These costs include engineering services, land rights, etc.

LIFE SPAN (YEARS)

The life span is the physical useful life of the practice. It should reflect the number of years the practice is expected to accomplish the conservation objective assuming normal maintenance and repair are applied. At the end of this time the practice is no longer serving its original purpose in using or conserving the resource and, therefore, a new capital investment will be needed to replace the practice. For annual practices the life span years is 1. In cost data NRCS usually uses economic life for life span.

OPERATION AND MAINTENANCE COST (O&M)

These represent the annual cost based on the value of materials, equipment and services needed to operate the resource improvement, and to make repairs necessary to maintain the practice in sound operating conditions during its life span (useful life). For annual practices that require no maintenance the O&M is zero. The O & M should be the average amount of money expended annually to maintain the function of the practice for the expected life. This is often expressed as a percentage of installation costs.

OPPORTUNITY COST

The value of something based on the value of another opportunity forgone to acquire it. Nearly every input or resource used has an alternative use. Opportunity cost is used to place a value on "what might have been". Opportunity cost can be defined in either of two ways (1) the income that would have been received if the resource had been used in its most profitable alternative use or (2) the value of the product not produced because the resource was used for some other purpose.

COSTS

COST TYPES:

NRCS uses four cost types for cost-sharing. These are (a) average cost, (b) actual cost not to exceed the average cost, (c) actual cost not to exceed a specified maximum cost, and (d) flat rate cost. Generally for conservation technical assistance (CTA) average cost are used to share information with the customer on what typical installation, operation and maintenance costs are expected. For programs, it is important to follow the program rules on which cost type to use, use General Manual instructions for contracting, and if approval of the cost list is required have that done prior to using it for contracts.

GUIDANCE FOR UPDATING COST DATA AND DEVELOPMENT OF COST LISTS

Cost data should be developed following the policy in 120 General Manual, Part 404, Subpart D, 404.13. Review and update cost data and cost lists on an annual basis. Cost data include costs for equipment and power, seeds, fertilizer, chemicals, labor, construction costs and other materials needed for the conservation practice to be installed. The use of cost data in computer programs saves time and effort in preparing contracts. Cost data and cost lists are used in analysis during the formulation and evaluation of alternatives. The typical cost per practice can be used to provide customers estimates of installation, operation, maintenance and replacement costs.

Actual cost data are to be collected on a representative number of jobs on all applicable measures and practices in each county, watershed or other defined area. In determining average cost data, information from suppliers, Farm Service Agency, Cooperative Extension Service, and other sources may be considered in addition to data collected from participants. Receipts from practices installed within the last year or surveys can be used to gather data on local prices. To determine the cost of management services, use the typical charge used by consultants or a typical rental rate. When contacting suppliers for prices, try to get an average retail price and not the bulk or discount price unless that item is usually purchased at bulk or discount prices by most buyers. When making contacts to get prices, try to contact a reasonable number of suppliers in the area. If all the prices are within 10% of each other, the average of those prices can be used. If you get a price that is unusually high or low, you will need to use some judgment as to whether to use that price or not. In some areas there may be only one supplier. If that is your only data and you feel it is typical for the area, then use that price. <u>It is important to get prices for components that meet the requirements in the conservation standards.</u>

Cost data includes the components for practices and is used to develop cost lists for practices. Cost data can be collected in the typical purchase units. Calculate a practice cost in the same units as the practice standard. The costs in the data base should reflect what are the typical costs for the practice described in the narrative. In addition to the price per unit for practices, the expected useful life and operation and maintenance per unit are needed to complete economic analysis.

Cost data and cost lists can be kept in electronic form in a computer file or a hard copy filed in FOTG, Section I Cost Data. Records of phone calls, previous contract data, and correspondence with vendors should be kept to assist in making future updates. The file system code for this is ECN 200-15 Conservation Practices Costs..

The tables that follow this introduction contain statewide average information for a variety of materials and practices used in conservation work throughout New York State. Local costs can vary from these averages. Therefore, local costs should be developed and used for estimating the costs of conservation work wherever possible.